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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/451,256	11/29/1999	STEVEN R. HOLLASCH	MSI-448US	8802

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EXAMINER	
AMINI, JAVID A	
ART UNIT	**PAPER NUMBER**
2672	11

DATE MAILED: 12/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

TS

Office Action Summary	Application No.	Applicant(s)	
	09/451,256	HOLLASCH, STEVEN R.	
	Examiner	**Art Unit**	
	Javid A Amini	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _10 October 2003_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-56_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-56_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.

4) ☐ Interview Summary (PTO-413) Paper No(s). _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 10, 2003 has been entered.

Allowable Subject Matter

The indicated allowability of claims 43-49 is withdrawn in view of the newly discovered reference to Yamrom, that invented a method for modeling an object with a polygonal mesh includes obtaining a closed-surface polygonal mesh and positioning the closed-surface polygonal mesh relative to the object. A ray is projected through a point-of-interest on the closed-surface polygonal mesh. An intersection point between the ray and a surface of the object is determined and the location of the point-of-interest is adjusted in response to the location of the intersection point. The projecting is performed for a plurality of points in the closed-surface polygonal mesh in order to approximate the object. Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-22, 24-33 and 35-56 rejected under 35 U.S.C. 102(e) as being anticipated by Yamrom.

1. As per claim 1, "defining a reference object relative to the represented object", Yamrom in abstract discloses a method for modeling an object with a polygonal mesh (examiner's interpretation: pre-determined shapes) includes obtaining a closed-surface polygonal mesh (examiner's interpretation: reference object) and positioning the closed-surface polygonal mesh relative to the object (examiner's interpretation: represented object). As for "determining the positions of the shapes relative to the reference objects using the characteristic data" Yamrom in abstract discloses the existence of an intersection point between said ray and a surface of the object is determined and the location (Examiner's interpretation: position using the characteristic data, see Fig. 4 of Yamrom) of the point-of-interest is adjusted in response to the existence and location of the intersection point. As for "determining, on the basis of the positions of the shapes relative to the reference object, those shapes that have no chance of intersecting the ray, and those remaining shapes that may intersect the ray", Yamrom illustrates clearly in Figs. 3 and 5 that at step 14, it is determined that the ray does not intersect surface, then flow proceeds to step 18 where the projected position is determined based on a reference distance (Examiner's interpretation: the basis of the positions of the shapes relative to the reference). Both steps 16 and 18 proceed to step 20 where the process ends if all points are processed. If not, step 22 locates the next point for processing. In Fig. 5 shows a similar projection in which the object is placed inside the reduced mesh. Due to holes (Examiner's interpretation: the basis of the

positions of the shapes relative to the reference) in the object, the ray 34 may not intersect the surface 36.

1. As per claim 2, "The method of claim 1 further comprising using a predetermined algorithm to determine which one of those remaining shapes intersects the ray", Yamrom in col. 7, lines 6-35 illustrates cylindrical projection algorithm.

2. Claims 3-4, "The method of claim 1, wherein the collection of shapes comprises at least one or plurality of polygonal shape/s", Yamrom in Figs. 2 and 10 illustrates it.

3. Claims 5 and 6, "wherein the collection of shapes comprises at least one or plurality triangle/s", Yamrom in Figs. 2 and 10 illustrates it.

4. Claims 7-9, "The method of claim 1, wherein the collection of shapes comprises a triangle mesh/strip/fan", Yamrom in Figs. 2 and 10 illustrates it.

5. Claims 10, 11, 14 and 15, Yamrom illustrates in Figs. 4 and 5. And also see col. 1, lines 50-52. The step of the reference object comprises a plane is inherent because in order to establish a model (or approximation) of an object, one must define the X, Y and Z planes parameters. That would be the same as the ray X and Y planes. In this case the plane becomes parallel to one of the x, y and z-axes.

6. Claims 12 and 13,"The method of claim 1, wherein said determining the positions of the shapes comprises determining positional aspects of sub-components of individual ones of the shapes to provide the characteristic data", "The method of claim 12, wherein the individual shapes comprise polygons and the sub-components comprise vertices that define the polygons, said determining the positions of the shapes comprising computing the positions of the vertices relative to the reference object";Yamrom in Figs. 3-5 illustrates, how to determine the

characteristic data. Yamrom in col. 2, lines 31-47 teaches the positions of the vertices relative to the reference object.

7. As per claim 16, "defining a collection of polygons that approximate an object, individual polygons having a plurality of vertices", "As for casting a ray toward the approximated object"; "defining a reference object relative to the collection of polygons and that contains the cast ray", "pre-characterizing at least some vertices of at least some of the polygons to provide characteristic data that describes the vertices position relative to the reference object; and using the characteristic data to ascertain the positions of the individual polygons relative to the reference object.", Yamrom in abstract discloses a method for modeling an object with a polygonal mesh includes obtaining a closed-surface polygonal mesh and positioning the closed-surface polygonal mesh relative to the object. Yamrom in abstract discloses the existence of an intersection point between said ray and a surface of the object is determined and the location (Examiner's interpretation: position using the characteristic data, see Fig. 4 of Yamrom) of the point-of-interest is adjusted in response to the existence and location of the intersection point. Yamrom illustrates clearly in Figs. 3 and 5 that at step 14, it is determined that the ray does not intersect surface, then flow proceeds to step 18 where the projected position is determined based on a reference distance. Both steps 16 and 18 proceed to step 20 where the process ends if all points are processed. If not, step 22 locates the next point for processing. In Fig. 5 shows a similar projection in which the object is placed inside the reduced mesh. Due to holes in the object, the ray 34 may not intersect the surface 36.

8. As per claim 17, "wherein the collection of polygons approximate the surface of the object", Yamrom in Fig. 2, illustrates it.

9. Claims 18 and 19, as for "wherein the individual polygons have a similar geometry; and wherein the individual polygons comprise triangles", Yamrom in Fig. 2 illustrates the features of these claims.

10. As per claim 20, "wherein the collection of polygons has a plurality of faces and a plurality of vertices, said faces outnumbering said vertices", Yamrom in Fig. 2 illustrates the features of this claim.

11. Claim 21 and 22, as for "wherein at least two of said polygons share at least one side; at least two of said polygons share is at least one vertex", Yamrom in Fig. 2 illustrates the features of these claims.

12. Claims 24 –27, Yamrom in abstract discloses a method for modeling an object with a polygonal mesh includes obtaining a closed-surface polygonal mesh and positioning the closed-surface polygonal mesh relative to the object. Yamrom in abstract discloses the existence of an intersection point between said ray and a surface of the object is determined and the location (Examiner's interpretation: position using the characteristic data, see Fig. 4 of Yamrom) of the point-of-interest is adjusted in response to the existence and location of the intersection point. Yamrom illustrates clearly in Figs. 3 and 5 that at step 14, it is determined that the ray does not intersect surface, then flow proceeds to step 18 where the projected position is determined based on a reference distance. Both steps 16 and 18 proceed to step 20 where the process ends if all points are processed. If not, step 22 locates the next point for processing. In Fig. 5 shows a similar projection in which the object is placed inside the reduced mesh. Due to holes in the object, the ray 34 may not intersect the surface 36.

13. Claim 28, Yamrom in Fig. 2 illustrates the features of this claim.

14. Claims 29-30, Yamrom in Figs. 2 and 3 illustrates the features of these claims.

15. Claims 31-33, Yamrom in abstract discloses a method for modeling an object with a polygonal mesh includes obtaining a closed-surface polygonal mesh and positioning the closed-surface polygonal mesh relative to the object. Yamrom in abstract discloses the existence of an intersection point between said ray and a surface of the object is determined and the location (Examiner's interpretation: position using the characteristic data, see Fig. 4 of Yamrom) of the point-of-interest is adjusted in response to the existence and location of the intersection point. Yamrom illustrates clearly in Figs. 3 and 5 that at step 14, it is determined that the ray does not intersect surface, then flow proceeds to step 18 where the projected position is determined based on a reference distance. Both steps 16 and 18 proceed to step 20 where the process ends if all points are processed. If not, step 22 locates the next point for processing. In Fig. 5 shows a similar projection in which the object is placed inside the reduced mesh. Due to holes in the object, the ray 34 may not intersect the surface 36.

16. Claim 35, Yamrom in Fig. 2 illustrates the features of this claim.

17. Claim 36, the step of the reference object comprises a plane is inherent because in order to establish a model (or approximation) of an object, one must define the X, Y and Z planes parameters. That would be the same as the ray in the X and Y planes. In this case the plane becomes parallel to one of the x, y and z-axes.

18. As per claim 37, "defining a sub-set of polygons from a collection of polygons that approximate an object by determining which polygons have vertices that satisfy a predefined relationship relative to a reference object; and evaluating the sub-set of polygons to ascertain which of the polygons is intersected by a cast ray", Yamrom in abstract discloses a method for

modeling an object with a polygonal mesh includes obtaining a closed-surface polygonal mesh and positioning the closed-surface polygonal mesh relative to the object. Yamrom in abstract discloses the existence of an intersection point between said ray and a surface of the object is determined and the location (Examiner's interpretation: position using the characteristic data, see Fig. 4 of Yamrom) of the point-of-interest is adjusted in response to the existence and location of the intersection point. Yamrom illustrates clearly in Figs. 3 and 5 that at step 14, it is determined that the ray does not intersect surface, then flow proceeds to step 18 where the projected position is determined based on a reference distance. Both steps 16 and 18 proceed to step 20 where the process ends if all points are processed. If not, step 22 locates the next point for processing. In Fig. 5 shows a similar projection in which the object is placed inside the reduced mesh. Due to holes in the object, the ray 34 may not intersect the surface 36.

19. Claims 38 and 39, Yamrom illustrates in Figs. 4 and 5. And also see col. 1, lines 50-52.

20. Claim 40, Yamrom in abstract discloses a method for modeling an object with a polygonal mesh includes obtaining a closed-surface polygonal mesh and positioning the closed-surface polygonal mesh relative to the object. Yamrom in abstract discloses the existence of an intersection point between said ray and a surface of the object is determined and the location (Examiner's interpretation: position using the characteristic data, see Fig. 4 of Yamrom) of the point-of-interest is adjusted in response to the existence and location of the intersection point. Yamrom illustrates clearly in Figs. 3 and 5 that at step 14, it is determined that the ray does not intersect surface, then flow proceeds to step 18 where the projected position is determined based on a reference distance. Both steps 16 and 18 proceed to step 20 where the process ends if all points are processed. If not, step 22 locates the next point for processing. In Fig. 5 shows a

similar projection in which the object is placed inside the reduced mesh. Due to holes in the object, the ray 34 may not intersect the surface 36.

21. Claim 41-42; see Yamrom in col. 8, lines 19-38.

22. Claim 43, Yamrom in abstract discloses a method for modeling an object with a polygonal mesh includes obtaining a closed-surface polygonal mesh and positioning the closed-surface polygonal mesh relative to the object. Yamrom in abstract discloses the existence of an intersection point between said ray and a surface of the object is determined and the location (Examiner's interpretation: position using the characteristic data, see Fig. 4 of Yamrom) of the point-of-interest is adjusted in response to the existence and location of the intersection point. Yamrom illustrates clearly in Figs. 3 and 5 that at step 14, it is determined that the ray does not intersect surface, then flow proceeds to step 18 where the projected position is determined based on a reference distance. Both steps 16 and 18 proceed to step 20 where the process ends if all points are processed. If not, step 22 locates the next point for processing. In Fig. 5 shows a similar projection in which the object is placed inside the reduced mesh. Due to holes in the object, the ray 34 may not intersect the surface 36.

23. Claims 44-46, Yamrom in Figs. 2 and 3 illustrates the features of these claims.

24. Claim 47, the step of the reference object comprises a plane is inherent because in order to establish a model (or approximation) of an object, one must define the X, Y and Z planes parameters. That would be the same as the ray X and Y planes. In this case the plane becomes parallel to one of the x, y and z-axes.

25. Claim 48, Yamrom in abstract discloses a method for modeling an object with a polygonal mesh includes obtaining a closed-surface polygonal mesh and positioning the closed-

surface polygonal mesh relative to the object. Yamrom in abstract discloses the existence of an intersection point between said ray and a surface of the object is determined and the location (Examiner's interpretation: position using the characteristic data, see Fig. 4 of Yamrom) of the point-of-interest is adjusted in response to the existence and location of the intersection point. Yamrom illustrates clearly in Figs. 3 and 5 that at step 14, it is determined that the ray does not intersect surface, then flow proceeds to step 18 where the projected position is determined based on a reference distance. Both steps 16 and 18 proceed to step 20 where the process ends if all points are processed. If not, step 22 locates the next point for processing. In Fig. 5 shows a similar projection in which the object is placed inside the reduced mesh. Due to holes in the object, the ray 34 may not intersect the surface 36.

26. Claim 49, Yamrom in Figs. 2 and 3 illustrates the features of these claims.

27. As per claim 50, "A computer graphic processing system comprising: a processor; memory; and software code stored in the memory that causes the processor to implement a ray-intersection algorithm which: casts a ray at a collection of shapes that approximate an object; defines a reference object that contains the ray; pre-characterizes aspects of individual ones of the shapes of the collection to provide characteristic data; and uses the characteristic data to ascertain the position of the shapes of the collection of shapes relative to the reference object.", Yamrom in abstract discloses a method for modeling an object with a polygonal mesh includes obtaining a closed-surface polygonal mesh and positioning the closed-surface polygonal mesh relative to the object. Yamrom in abstract discloses the existence of an intersection point between said ray and a surface of the object is determined and the location (Examiner's interpretation: position using the characteristic data, see Fig. 4 of Yamrom) of the point-of-

interest is adjusted in response to the existence and location of the intersection point. Yamrom illustrates clearly in Figs. 3 and 5 that at step 14, it is determined that the ray does not intersect surface, then flow proceeds to step 18 where the projected position is determined based on a reference distance. Both steps 16 and 18 proceed to step 20 where the process ends if all points are processed. If not, step 22 locates the next point for processing. In Fig. 5 shows a similar projection in which the object is placed inside the reduced mesh. Due to holes in the object, the ray 34 may not intersect the surface 36.

28. Claims 51, 52 and 53, Yamrom in Fig. 2 illustrates the features of these claims. Yamrom in col. 7, lines 6-35 illustrates cylindrical projection algorithm.

29. Claim 54, Yamrom in Fig. 2 illustrates the features of this claim.

30. Claim 55, Yamrom illustrates in Figs. 4 and 5. And also see col. 1, lines 50-52.

31. Claim 56, Yamrom in Fig. 2 illustrates the features of this claim.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

32. Claims 23 and 34 rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. "Wherein none of polygons share a vertex" critical or essential to the practice of the invention, but not included in the claims is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). The claim language does not have any logical meaning, because it is not clear whether the invention uses a single polygon or plurality

of polygons. How does the approximation of an object can be detected with only one polygon? If it does, what happens the space between the polygons, which do not share vertices? However in the specification on page 10 lines 10 sets forth as follows: Other collections can be defined where none of the triangles share a vertex. Therefore the claims languages are not following the specification languages.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Javid A Amini whose telephone number is 703-605-4248. The examiner can normally be reached on 8-4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on 703-305-4713. The fax phone number for the organization where this application or proceeding is assigned is 703-746-8705.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-0377.

Javid A Amini
Examiner
Art Unit 2672

Javid Amini

Jeffery A. Brier
JEFFERY BRIER
PRIMARY EXAMINER